Provisional Application

of

IGOR K. KOTLIAR

for

United States Letters Patent
for improvements in

HYPOXIC TENT SYSTEM

"Express Mail" mailing label

number_____

Date of deposit 7/31/97

IGOR K. KOTLIAR

Igor K. Kotliar

Application of

IGOR K. KOTLIAR

for

United States Letters Patent
for improvements in

HYPOXIC TENT SYSTEM

"Express Mail" mailing label

Number EG392395764US

Date of Deposit 23 December 1997

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Office to Addressee" service under 37 C.F.R. 1.10 on the date indicated above and is addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

IGOR K. KOTLIAR
Printed Name

Igor K. Kotliar
Signature

This appln claims the benefit of US Provisional Appln. No 60/055,087 Filed Jul. 31, 1997 and

TP 8-13-99

Now U.S. Patent No. 5,799,652

~~This application is~~ a continuation in part of patent applications 08/505,621 "Hypoxic Room System and equipment for hypoxic training and therapy," filed 21 July 1995, 08/739,379 Now ABN "Hypoxic flow system for individual active and passive hypoxic training," filed 29 October 1996, ~~and~~ 08/797,242 "Apparatus for passive hypoxic training and therapy," filed 8 February 1997 Now Pat. No. 5,924,419 which is a C-I-P of

C.w. A 6/1/99

Allowed

FIELD OF INVENTION

This invention relates to enclosed low-oxygen environments created for resting in for the purposes of improving the cardio-pulmonary system of professional athletes, and for improving the health of any user, including the sick, injured and disabled.

The Hypoxic Tent System provides a safe low-oxygen environment at normal atmospheric pressure at simulated altitudes up to 15,000 feet or higher for sleeping in.

The benefits of the inhalation of low oxygen gas mixtures are fully described in previous patent applications 08/505,621, 08/739,379 and 08/797,242, and have recently been the focus of worldwide media attention. An athlete sleeping at a simulated altitude will increase his pulmonary ventilation and red blood cell count, and will need less oxygen to achieve the same performance level. This means his performance will improve in a normal oxygen environment. Hypoxic training may also be used in preparation for competition at high altitudes.

The invention presented here provides a convenient, low cost solution to create such an environment for sleeping. This invention makes it possible to make a portable version of the Hypoxic Room System, convenient for athletes while traveling, and may be easily installed at home or in any hotel room.

The Hypoxic Tent System can also be used as a therapeutic device to increase strength and endurance and boost immunity. The disabled can use this system for training their cardio-pulmonary systems.

PRIOR ART

The U.S. Patent No. 5,467,764 of November 21 1995, "Hypobaric Sleeping Chamber," shows hypobaric sleeping chamber, which is used by some athletes for sleeping in for the purposes of improving pulmonary performance. This invention has significant drawbacks. Firstly, this chamber must be completely sealed, which requires rigid construction and is unsafe. Also, it has a negative psychological effect, since the user is cut off from the outside world and is confined inside a narrow tube. Further, the low pressure and dryness created inside this chamber can cause rapid dehydration, enlargement of internal organs, headaches, and irritation of the sinus and respiratory system.

2

DESCRIPTION OF THE INVENTION

Figure 1 shows a schematic view of the most preferred embodiment 10. A tent 11 is fitted onto a bed 14 and upheld by supporting arches 12 and 13, which are first fastened onto the sides of a mattress 15 preferably by means of a drawstring or an elastic band (not shown). Tent 11, having a drawstring 16 with a locking device 17 at its bottom edge, is additionally tightened over the sides of mattress 15.

Tent 11 is made of light, thin fabric such as parachute nylon or synthetic material such as clear vinyl or a combination of both. The most preferred material is one which will allow the fast diffusion of moisture from tent 11. Tent 11 has an entryway 18, which can be closed preferably by a zipper, ziploc mechanism, Velcro, magnetic tape or other closing device, openable and closeable from the inside or outside of tent 11.

Supporting arches 12 and 13 are preferably made from light metal or plastic tubes which can be disassembled in segments. Arch 13 is fitted to tubing 20 on one end, is closed on the other end and has discharge nozzles 19 inside tent 11. A hypoxicator 21, described in previous patent applications, supplies low oxygen air into tent 11 through tubing 20, arch 13 and discharge nozzles 19.

Tent 11 can also have an inflatable supporting structure instead of the supporting tubing of arches 12 and 13.

A filter 22 filters the low oxygen air of airborne particles and bacteria. The most preferred type of filter is a HEPA filter, which is widely available from a number of manufacturers. An optional air cooling device 23 may be installed in the system to cool the low oxygen air for comfort. The cooling effect may also be achieved by increasing the length of tubing 20 if the ambient air outside tent 11 is already cool. For hot and humid climates, a separate air conditioning unit (not shown) may be installed instead of cooling device 23. This separate air conditioning unit would draw in air from tent 11, cool and dehumidify it and recirculate it back into tent 11. However, in most cases, excessive water vapor and carbon dioxide, much faster than other gases, will quickly diffuse through the fabric of tent 11, and will escape along with exiting air.

Hypoxicator 21 draws ambient air in and separates it into oxygen enriched and oxygen depleted fractions, employing membrane separation or pressure-swing adsorption technologies. The oxygen enriched fraction is expelled from hypoxicator 21 and the oxygen depleted fraction, having an oxygen content preferably from 11 to 15 percent, is constantly pumped into tent 11. A standard hypoxicator made by Hypoxico Inc. supplies approximately 60 liters/minute of hypoxic air with a 15% oxygen content, which corresponds to an altitude of 8,500 feet, providing the most suitable and safe environment for hypoxic training during sleep. Air pressure remains near normal inside tent 11 as a result of air exiting from naturally existing gaps in the tent construction, which does not have to be airtight. For example, air can exit around the zipper or other closing mechanism of entryway 18, as a result of the looseness of drawstring 16 and through fabric pores. Additional air escape openings may be provided as well, if necessary.